

SECTION 5

METHODOLOGY

Effect determinations were assessed by determining the presence or absence of T&E habitat and if present, analyzing the potential effects of environmental measures and O&M activity associated with each alternative. Effects determination for each listed species was based on the following definitions:

- “No effect” – Either the T&E species habitat was not present in the RGCP and/or the alternative would have no effect on available T&E species habitat.
- “May affect – is not likely to adversely affect” – T&E species habitat or T&E individuals could potentially be present in the RGCP and the alternative would have beneficial, insignificant or discountable effects.
- “May affect – is likely to adversely affect” – T&E species habitat or T&E individuals could potentially be present in the RGCP and the adverse effects can not be avoided.

5.1 ASSUMPTIONS REGARDING PRESENCE OR ABSENCE OF T&E HABITAT

The following assumptions formed the basis of determining potential presence or absence of T&E species within the RGCP:

- The likelihood for T&E species to occur in the RGCP could be substantially determined from literature reviews and comparisons of species life history requirements with vegetation community descriptions.
- Analyses of aerial photography and development of vegetation maps could be used to concentrate field surveys in areas containing possible T&E habitat.
- Although the likelihood of actually observing a rare species in the course of field surveys was low, suitability of habitat was readily identifiable in the field.

5.2 ASSUMPTIONS REGARDING EFFECTS ON POTENTIAL T&E HABITAT DUE TO IMPLEMENTING ENVIRONMENTAL MEASURES

The goal of implementing environmental measures is to improve and restore native riparian communities and diversify aquatic habitat in the RGCP. As a result, an assessment of potential future environmental conditions is necessary to analyze the effects on T&E species. Assumptions concerning the effects of future environmental conditions on listed species included:

- The current anthropomorphic factors would continue to be the dominating influence. Specifically the highly altered hydrologic and sediment regime would remain in place through the implementation period.

- The amount of reference community created assumed successful implementation of environmental measures.
- Environmental measures would result in a community comparable to the reference communities described in subsection 4.7. Sites would vary in seral stage, structure and site-specific characteristics, but generally classified as the reference community.
- Native communities would develop over a 20-year implementation period.

5.3 WORK PLAN

A work plan for T&E surveys was completed in April 2000 and approved by USIBWC. The approved work plan was provided to the USFWS Austin Regional Office, New Mexico Department of Game and Fish (NMGF), and Texas Parks and Wildlife Department (TPWD). Four field surveys were conducted. Survey objectives are described below.

Spring T&E Habitat Survey, April 24 through 28, 2000

- Identify vegetation communities present within the RGCP,
- Assess the presence or absence of potentially suitable habitat for threatened or endangered species at 42 locations.

Fall Aquatic Survey, September 11 through September 22, 2000

- Characterize aquatic habitat in the RGCP,
- Identify aquatic species occurring in the RGCP during high flow (irrigation period).

Fall/Winter Vegetation Survey, November 27 through December 1, 2000

- Conduct additional habitat surveys based on 148 vegetation survey locations conducted in conjunction with wildlife habitat surveys.

Winter Aquatic Habitat Survey, January 22 through January 24, 2001

- Identify aquatic species occurring during low flow (non-irrigation period).

Terrestrial and aquatic field surveys were conducted along the entire RGCP. Surveys were concentrated in areas that contained potentially suitable habitat based on the initial land cover analyses and species-specific reports.

The fall aquatic survey was scheduled to coincide with high irrigation flows in the Rio Grande. The fall/winter terrestrial T&E species survey was scheduled to coincide with avian migrations, while the winter aquatic survey was scheduled to occur during low flow.

Staff

The staff used to perform surveys, identify terrestrial and aquatic flora and fauna, perform geographic information system (GIS) analysis, and report results are identified in Table 5.1.

Table 5.1 List of Preparers

STAFF	EXPERTISE
R.C. Wooten, Ph.D.	Project Principal, NEPA, and technical direction
Carlos Victoria-Rueda, Ph.D.	Project management
James Hinson, M.S.	Biologist
Rick Billings, M.S.	Southwestern aquatic systems
John Sigler, Ph.D.	Southwestern aquatic systems
Patty Phillips, M.S.	Ornithology, southwestern vegetation
Mike Sipos, M.S.	Mammalogy, ornithology, GIS, GPS
Chris Westerman, M.S.	Wetlands, southwestern vegetation

5.4 T&E SPECIES INFORMATION SUPPLIED BY AGENCIES

Information on T&E species in the RGCP was requested from the USFWS, TPWD, and NMGF. Table 5.2 lists federally-listed species potentially occurring in the RGCP, along with their state listing status. Information from these agencies and other published sources was used to determine habitat requirements for each protected species. Correspondence with agencies are provided in Appendix A.

5.5 TERRESTRIAL FIELD SURVEY METHODS

5.5.1 Spring Field Surveys

Survey locations included wetlands and riparian zones along the Rio Grande and representative sample sites within major vegetation communities. Survey locations were based on preliminary vegetation maps, species distribution information, and habitat preference data to concentrate surveys within potential endangered or threatened species habitat. Sites most likely to contain potential threatened or endangered species habitat were emphasized during the survey. All survey locations were recorded using a global positioning system (GPS) and are depicted in Figure 5.1.

The Seldon Canyon RMU was not surveyed. Seldon Canyon is located within the RGCP; however, the USIBWC has limited ROW with the majority of the river section held as private property. The privately owned section begins north of Leasburg Dam and ends south of Seldon Bridge, a distance of 8.6 miles.

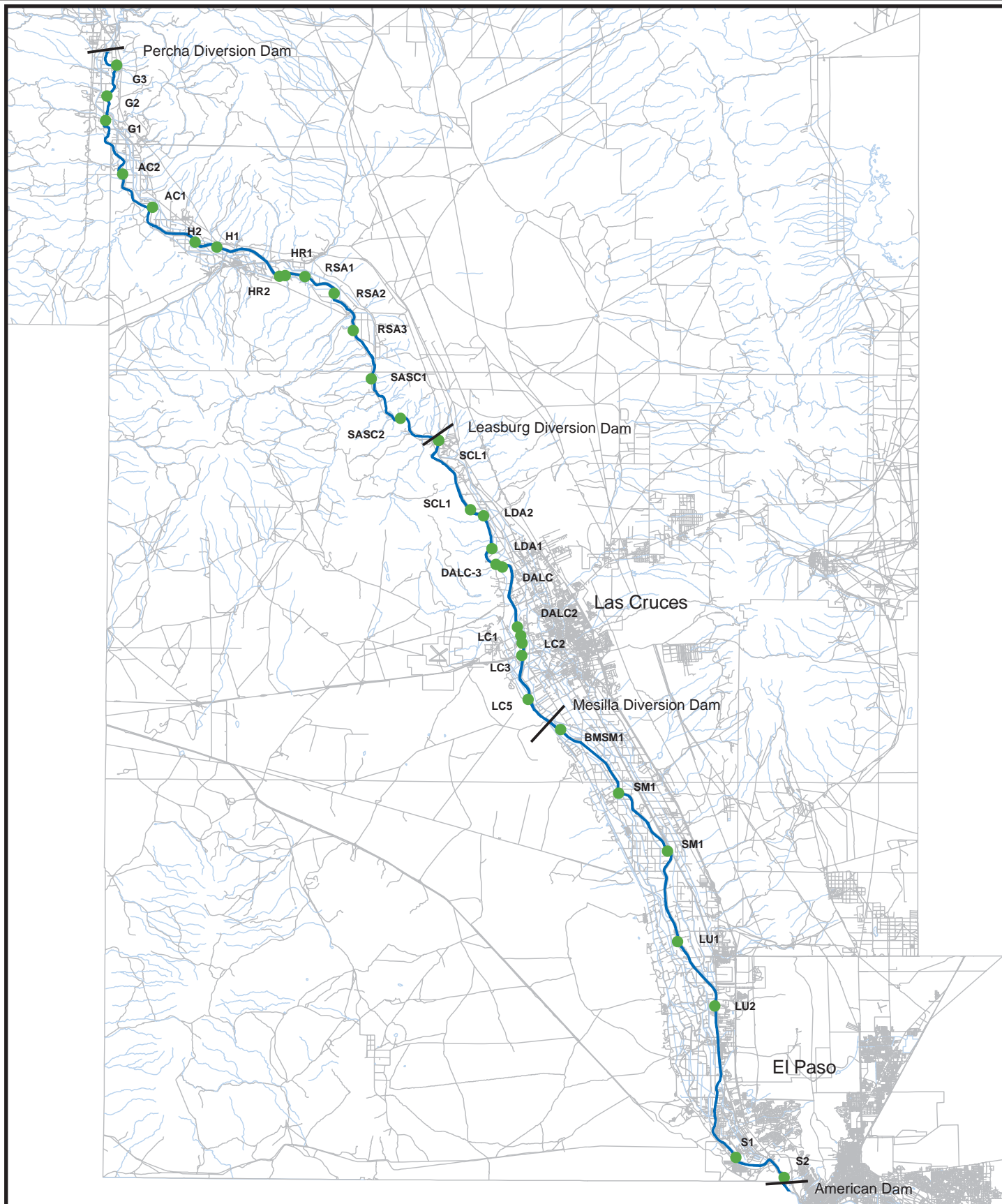
Table 5.2 T&E Species Potentially Occurring in the RGCP

		LISTING STATUS*	
COMMON NAME	SCIENTIFIC NAME	STATE	FEDERAL
El Paso County, TX			
Interior least tern	<i>Sterna antillarum</i>	E	E
Northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	E	E
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	E	E
Sneed pincushion cactus	<i>Coryphantha sneedii</i> var. <i>sneedii</i>	E	E
Mexican spotted owl	<i>Strix occidentalis lucida</i>	T	T
Doña Ana County, NM			
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	T
Black-footed ferret	<i>Mustela nigripes</i>	S	E
Interior least tern	<i>Sterna antillarum</i>	E	E
Mexican spotted owl	<i>Strix occidentalis lucida</i>	S	E
Northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	E	E
Sneed pincushion cactus **	<i>Coryphantha sneedii sneedii</i>	E	E
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	E	E
Whooping crane	<i>Grus americana</i>	E	E
Sierra County, NM			
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	T
Black-footed ferret	<i>Mustela nigripes</i>	S	E
Chiricahua leopard frog	<i>Rana chiricahuensis</i>	S	C
Gila trout	<i>Oncorhynchus gilae</i>	T	E
Mexican spotted owl	<i>Strix occidentalis lucida</i>	S	E
Northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	E	E
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	E	E
Todsen's pennyroyal **	<i>Hedeoma todsenii</i>	E	E
Whooping crane	<i>Grus americana</i>	E	E

T – Threatened; E – endangered, S – sensitive; C – candidate;

** New Mexico endangered plant species listed as protected, category L1.

Color Infrared Orthoimagery and aerial photographs were used to create preliminary vegetation maps along the 106-mile study corridor. *In situ* vegetation characterization (pedestrian surveys) were conducted to provide more detailed vegetative descriptions (e.g., dominant vegetation species, vegetation structure) at selected survey locations. Vegetation characterizations were conducted at 42 sites along the river. Each of these sites was photographed. A photo log of selected sites is found in Appendix F.



● Survey Location

SCALE = 1 : 570,000 or 1 INCH = 47,500 FEET
UTM Zone 13 N / NAD 83

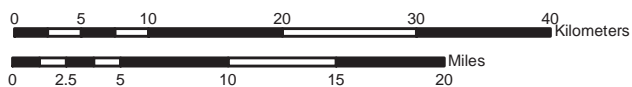
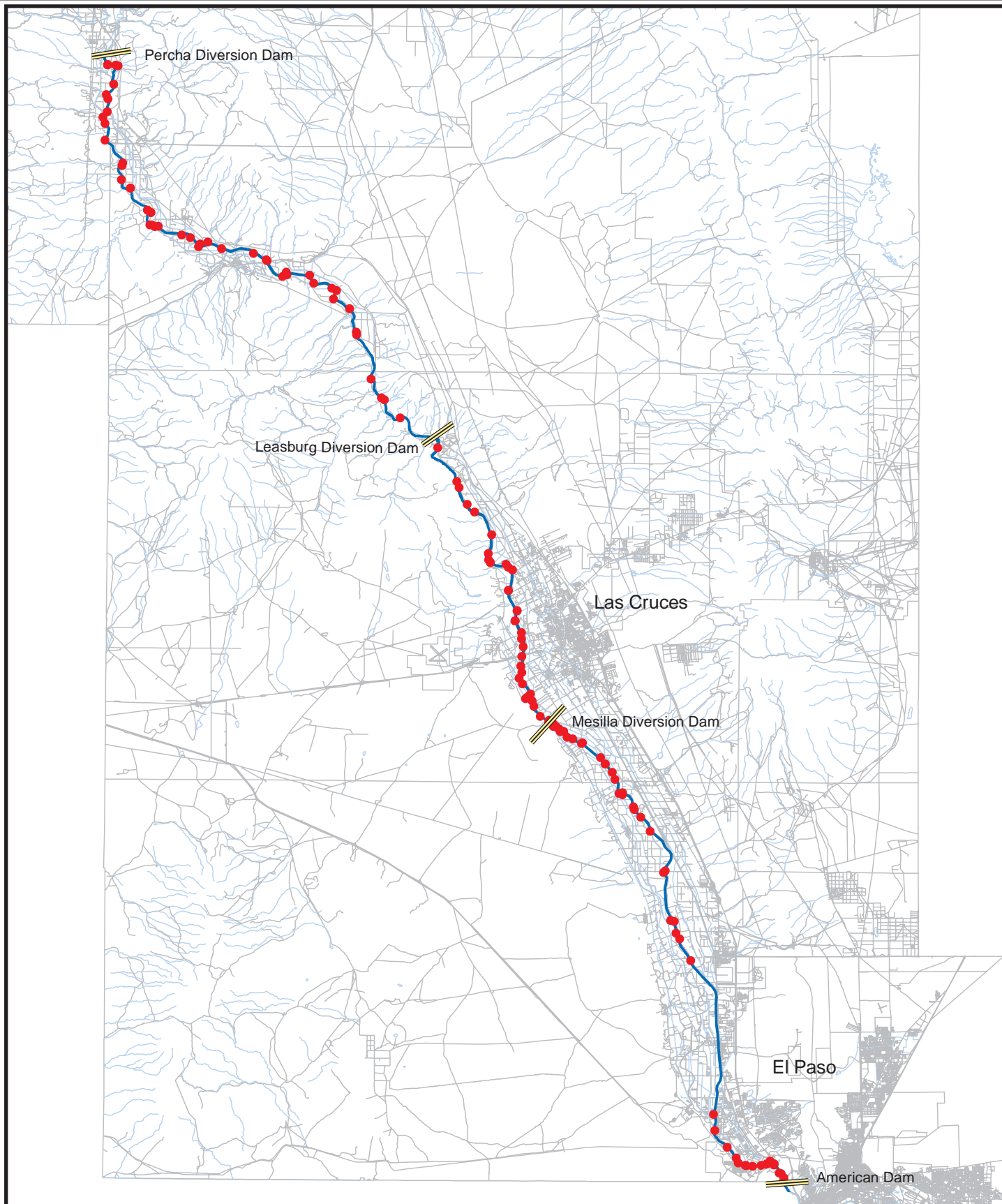


Figure 5-1 Locations of Spring Terrestrial Survey



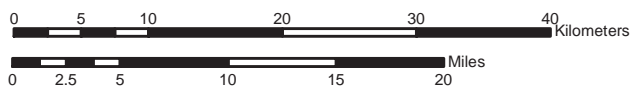
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● Survey Location

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**Figure 5-2 Locations of Fall / Winter
Detailed Vegetation Survey**



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5.5.2 Fall/Winter Vegetation Survey

Fall/Winter terrestrial field surveys were conducted November 27 through December 1, 2000 to develop detailed vegetation classification maps, assess wildlife habitat value and conduct additional wildlife species pedestrian surveys. The wildlife habitat appraisal procedure (WHAP) (TPWD 1995) was used to record the following information at each survey location:

- Vegetation and species diversity.
- Position of species associations (*e.g.*, riparian zone, floodway, or levee).
- Vegetation utilization by wildlife.
- Site potential.
- Uniqueness and relative abundance.
- Vertical vegetation stratification.
- Other structural diversity components (*e.g.* brush and rock piles, snags, fallen logs, thick grass cover, etc.).
- Condition of existing vegetation.
- Any wildlife species observed.
- Other notes (*e.g.*, signs of cattle use, structures, habitat features such as wetlands).

Vegetation community characterizations were made at 148 survey locations (Figure 5.2). If T&E species were observed during vegetation surveys, identifications were documented in field logs and on vegetation survey forms. Vegetation species lists are found in Appendix E.

5.6 AQUATIC SURVEYS

5.6.1 Surveys at Sampling Transects

Physical and chemical information was recorded at transect locations along the RGCP (Table 5.3 and Figure 5.3). During the fall (high flow) collections, all data points, including river cross-section locations, were captured by GPS. Depth and water velocity at each transect location (1 to 10 points per cross section) were recorded with a Marsh-McBirney Model 2000 portable water flow meter. Water quality parameters were measured during both field surveys using a Yellow Springs Instruments model 650 MDS probe system. These parameters were water temperature, pH, dissolved oxygen, and conductivity. Appendix G presents aquatic survey results.

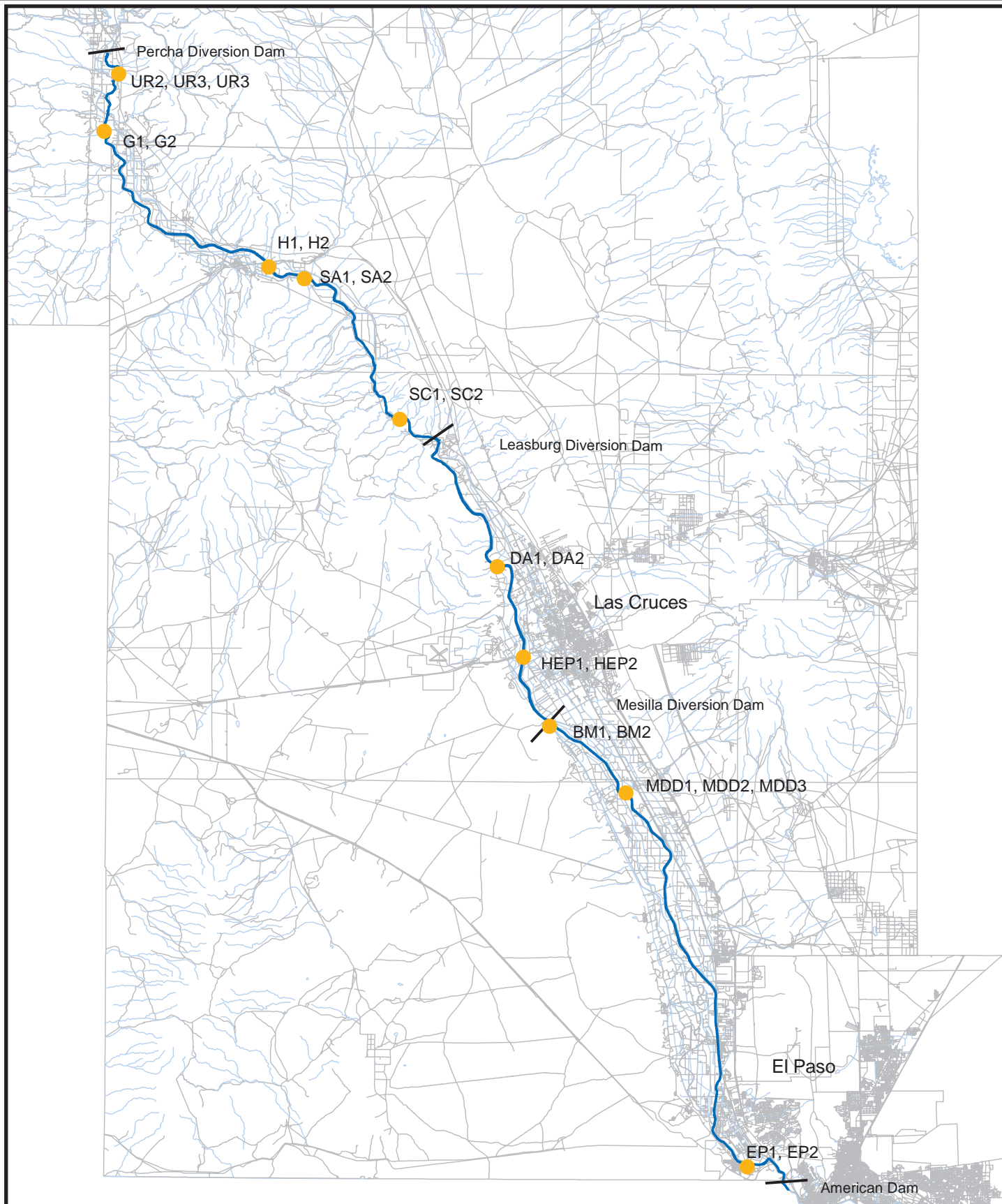
Table 5.3 Transect Location for Aquatic Sampling Sites

MANAGEMENT UNIT	TRANSECT SERIES	TRANSECT IDENTIFICATION	COMMENTS
Upper Rincon	Upper Rincon	UR2, UR3, UR3	At Tipton Arroyo
Upper Rincon	Garfield	G1, G2	Sibley Arroyo
Lower Rincon	Hatch	H1, H2	Downstream of Rincon Siphon
Lower Rincon	Sierra Alta	SA1, SA2	At Rincon Arroyo
Seldon Canyon	Seldon Canyon	SC1, SC2	Highway 185 at Mile Marker 18
Upper Mesilla	Doña Ana	DA1, DA2	Downstream of Shalem Colony Bridge
Las Cruces	Las Cruces	HEP1, HEP2	Downstream of Picacho Bridge
Lower Mesilla	Black Mesa	BM1, BM2	Downstream of Mesilla Bridge
Lower Mesilla	Mesilla Valley	MDD1, MDD2, MDD3	Downstream of Mesilla Diversion Dam
El Paso	El Paso	EP1, EP2	At Cottonwood Bosque Area

Cross sections were completed at each transect location, and readings from the GPS and flow were taken. Depth and velocity readings were recorded on field data sheets. Distance between data points at a given transect was based on notable changes in depth or velocity. Physical chemistry readings were recorded on field data sheets once for each management unit location. Electrofishing or seining was completed at each transect location to document fish species present. All habitat types at the location were electrofished or seined.

5.6.2 Additional Sampling Conducted at USFWS Mitigation Sites

In 1994-1995, accumulated sediment was removed from the confluence zones of 14 arroyos within the RGCP by the USIBWC downstream of Caballo Dam. Mitigation for unavoidable impacts to aquatic habitat was required by the U.S. Army Corps of Engineers for approval of the Section 404 permit. Mitigation measures included construction of two vortex weirs, three embayments, and nine groins. Mitigation sites were included in the surveys of the aquatic ecosystem, not only because of their presence in the RGCP, but because of the quantitative information being collected on the sites by the USFWS, New Mexico Fisheries Resource Office, Albuquerque.



● Aquatic Sampling Transect Locations



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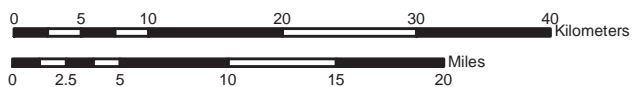


Figure 5-3 Map of Aquatic Sampling Transects



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